

$^{11}\text{B}(\text{He},\text{d})$     1961Hi08,1971Re03

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	J. H. Kelley, J. E. Purcell and C. G. Sheu		NP A968, 71 (2017)	1-Jan-2017

1961Hi08:  $^{11}\text{B}(\text{He},\text{d})$  E=9.84 MeV.

1967Cr04:  $^{11}\text{B}(\text{He},\text{d})$  E=10 MeV, measured  $\sigma(E_d,\theta)$ .  $^{12}\text{C}$  deduced DWBA fits.

1968Bo26:  $^{11}\text{B}(\text{He},\text{d})$  E=11 MeV, measured  $\sigma(E_d,\theta)$ .  $^{12}\text{C}$  levels deduced S.

1969Mi15:  $^{11}\text{B}(\text{He},\text{d})$  E=10,12,18 MeV, measured  $\sigma(E_d,\theta)$ .  $^{12}\text{C}$  levels deduced S.

1971Re03:  $^{11}\text{B}(\text{He},\text{d})$  E=44 MeV, measured  $\sigma(E_d,\theta)$ .  $^{12}\text{C}$  deduced levels, J,  $\pi$ , level-width.

1988Ig03:  $^{11}\text{B}(\text{He},\text{d})$  E=18.3,22.3 MeV, measured  $\sigma(\theta)$ ,  $d\gamma/\theta$ . Deduced model parameters.  $^{12}\text{C}$  level deduced substate population.

1993Ar14:  $^{11}\text{B}(\text{He},\text{d})$  E=32.5 MeV, measured  $\sigma(\theta)$ . Deduced model parameters, vertex constants.  $^{12}\text{C}$  levels deduced spectroscopic factors.

1996Ar07:  $^{11}\text{B}(\text{He},\text{d})$  E=22.3-34 MeV, measured  $\sigma(\theta)$ ,  $\sigma(E_d)$ . Deduced reaction mechanism.  $^{12}\text{C}$  level deduced spectroscopic factors, vertex constants.

2012Sm06: XUNDL dataset compiled by TUNL, 2012.

Measured  $^{11}\text{B}(\text{He},\text{d})^{12}\text{C}$  in search of a  $^{12}\text{C}$  level at  $E_x=11.16$  MeV with  $J^\pi=2^+$  that was previously reported at  $E(^3\text{He})=44$  MeV (1971Re03).

A beam of  $E(^3\text{He})=44$  MeV ions impinged on a 98% enriched  $395 \mu\text{g}/\text{cm}^2$  self supporting  $^{11}\text{B}$  target at the iThemba LABS.

Scattered deuterons were measured at the focal plane of the K600 spectrometer at angles of  $\theta_{\text{lab}}=25^\circ$ ,  $30^\circ$  and  $35^\circ$ . Additional measurement were made on a natural boron target with a high  $^{16}\text{O}$  contamination. Analysis revealed numerous  $^{12}\text{C}$  excited states, but no evidence was found for any state that could be identified with  $E_x=11.16$  MeV.

 $^{12}\text{C}$  Levels

E(level)	$J^\pi$	$\Gamma$	L_P #	(2J+1)S <sub>REL.</sub> @	Comments
0	$0^+$		1	5.4	T=0
$4.44 \times 10^3$	$2^+$		1	0.78	T=0
$7.66 \times 10^3$	$0^+$		1	0.078	T=0
9629. 10	$3^-$		2	0.28	T=0 $(2J+1)\theta_P^2=0.048.$
$10.1 \times 10^3$ ?					
$10.84 \times 10^3$ 2	$1^-, 2^-$	250 keV 30	0	1.1	T=0 $(2J+1)\theta_P^2=0.040.$
$11.16 \times 10^3$ 5	$(2^+)$			0.14	T=0 E(level): This level was reported in (1971Re03), but (2012Sm06) found evidence against its existence.
$11.82 \times 10^3$ 2	$2^-$	235 keV 30	2	0.17	T=0 $(2J+1)\theta_P^2=0.073.$
$12.70 \times 10^3$ 1	$1^+$		1	1.00	T=0 $(2J+1)\theta_P^2=0.13.$
$13.38 \times 10^3$ 2	$(2^-)$	0.55 MeV 80	0		T=0
$14.71 \times 10^3$ 1		<12 keV	0		
$15.11 \times 10^3$	$1^+$		1	0.92	T=1
$16.11 \times 10^3$	$2^+$		1	1.1	T=1
$17.23 \times 10^3$	$1^-$				T=1
$18.27 \times 10^3$ 5	$(4^-)$	275 keV 40	(2)		T=(0)
$18.38 \times 10^3$	$(3^-)$	212 keV 40	(2)		T=(1) Γ: From (1971Re03).
$19.25 \times 10^3$	$(1^-)$				T=(1)
$19.56 \times 10^3$ 5	$(4^-)$	393 keV 65	(2)		T=(1)
$20.6 \times 10^3$	$(3^-)$	196 keV 40	(2)		T=(0)
$22.40 \times 10^3$ 8	$(1^-)$	275 keV 40	(2)		T=(1)

Continued on next page (footnotes at end of table)

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 $^{11}\text{B}(\text{d},\text{n})$     [1961Hi08,1971Re03 \(continued\)](#) $^{12}\text{C}$  Levels (continued)

<sup>†</sup> Deduced from  $\Gamma_{\text{lab}}$  ([1961Hi08,1971Re03](#)).

<sup>‡</sup> From  $^{11}\text{B}(\text{d},\text{n})$  and  $^{11}\text{B}(\text{He},\text{d})$  in ([1975Aj02](#)).

<sup>#</sup> From ([1971Re03](#)) and references in ([1968Aj02](#)).

<sup>@</sup> From ([1971Re03](#)), see other values given in ([1967Fu07,1968Bo26,1969Mi15,1971Mu18,1993ar14,1996Ar07](#)) and see comments in ([1977Ad02](#)).